

AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings include changes to Figures 20 and 21C. These sheets, which include Figures 20 and 21C, replace the original sheets including Figures 20 and 21C.

Attachment: 2 Replacement Sheets

REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1-18 and 20-45 are presently active in this case. The present Amendment amends Claims 1, 3, 4 and 29-30; cancels Claim 19 and adds new Claims 33-45 without introducing any new matter.

Claims 1, 4-7, 18, 21, 24 and 29-30 were rejected under 35 U.S.C. §102(b) as anticipated by Tsumura et al. (U.S. Patent No. 5,500,537, herein "Tsumura"). Claims 2, 20, 23 and 25 were rejected under 35 U.S.C. §103(a) as unpatentable over Tsumura. Claim 19 was rejected under 35 U.S.C. §103(a) as unpatentable over Tsumura in view of Nishizawa et al. (U.S. Patent No. 5,355,235, herein "Nishizawa"). Claim 26 was rejected under 35 U.S.C. §103(a) as unpatentable over Tsumura in view of Yang et al. (U.S. Patent Publication No. 2002/013555). Claims 31 and 32 were rejected under 35 U.S.C. § 103(a) as unpatentable over Tsumura in view of Ong et al. (U.S. Patent Publication No. 2003/0164495).

Claim 3 was indicated as allowable if rewritten in independent form. Applicant acknowledges with appreciation the indication of allowable subject matter.

In response, Claim 3 is rewritten in independent form by incorporating all the features of Claim 1. Further, Claims 29 and 30 are amended to include all the features of Claim 3. New Claims 33-45 are added to vary the scope of protection recited in the claims. Claim 33-36 correspond to Claims 4-7, now depending upon allowable Claim 3. Claims 37-45 correspond to Claims 18-26, now directly or indirectly depending upon allowable Claim 3. Since the new claims find non-limiting support in the original claims, the claims are not believed to raise a question of new matter.¹

¹ See MPEP 2163.06 stating that "information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter."

Further, since Applicant considers that Claim 19 defines patentable subject matter, Claim 1 is amended to recite all the features of Claim 19. Consequently, Claim 19 is cancelled.

In response to the Restriction Requirement being made final, Claims 8-17 and 27-28, directed to non-elected Species II-V, are withdrawn. Applicant reserves the right to present claims directed to the non-elected inventions in a divisional application, which shall be subject to the third sentence of 35 U.S.C. §121.²

In order to correct minor informalities, the Specification at page 37, lines 7-19 is amended to correct the numerical values for the channel width. The wrong channel width values were caused by the use of the wrong unit conversion from angstroms to nanometers. In light of their formal nature and the thickness values recited at page 70 of the specification, for example, the changes to the Specification do not raise a question of new matter.

In order to correct minor formalities in the drawings, submitted herewith is a Letter Submitting Drawing Sheets along with 2 Replacement Sheets for Figures 20 and 21C. Since these changes to the drawings only add connections omitted by mistake and these connections are inherently described in the Specification, it is believed that they do not raise a question of new matter.

In response to the rejection of Claim 19 under 35 U.S.C. §103(a) as unpatentable over Tsumura in view of Nishizawa, Applicant respectfully requests reconsideration of this rejection and traverses the rejection, as discussed next.

Briefly recapitulating, Applicant's invention, as recited in amended Claim 1, now amended to recite all the features of Claim 19, relates to a semiconductor device, including: a gate electrode; an insulating layer on the gate electrode; a first electrode on the insulating layer; a second electrode on the insulating layer at an interval with the first electrode; an

² "A patent issuing on an application with respect to which a requirement for restriction under this section has been made ... shall not be used as a reference ... against a divisional application." See also MPEP 804:01.

organic semiconductor layer disposed in the interval between the first electrode and the second electrode and covering at least part of the first electrode and the second electrode; and a first resistance layer formed on the organic semiconductor layer and having an electrical resistance lower than an electrical resistance of the organic semiconductor layer, wherein the first resistance layer is formed from, *inter alia*, polythiophene and derivatives thereof. As explained in Applicant's specification at page 7, lines 2-17, Applicant's invention improves upon conventional semiconductor devices because it can decrease the current in the off-state of an organic semiconductor channel

Applicant respectfully traverses the obviousness rejection based on Tsumura and Nishizawa because there is insufficient evidence establishing the required reasonable motivation to modify Tsumura's FET transistor with a channel between a source electrode and a drain electrode made from an organic semiconductor by incorporating Nishizawa's first organic layer and second organic layer formed of polythiophene, for the following reasons.³

The outstanding Office Action states that the proposed modification would have been obvious "to replace the first resistance layer (second organic layer) in Tsumura's device with polythiophene layer as shown by Nishizawa."⁴ The record, however, fails to provide the required *evidence* of a motivation for a person of ordinary skill in the art to perform such modification. While Nishizawa may provide a reason for using polythiophene in a first organic layer constituting a channel and in a second organic layer formed adjacent to the channel for an organic field effect element, Nishizawa fails to suggest why a person of ordinary skill in the art would be motivated to incorporate such a feature in a field effect

³ See MPEP 2143.01 stating "[o]bviousness can only be established by combining or modifying the teaching of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art," (citations omitted). See also MPEP 2144.08 III stating that "[e]xplicit findings on motivation or suggestion to select the claimed invention should also be articulated in order to support a 35 U.S.C. 103 ground of rejection. . . . Conclusory statements of similarity or motivation, without any articulated rational or evidentiary support, do not constitute sufficient factual findings."

⁴ See outstanding Office Action at page 12, lines 14-18.

transistor having an organic layer 7b not being in contact with the gate electrode, such as the one disclosed in Tsumura. In particular, Nishizawa uses the first and second organic layer in order to change an electrical conductivity of the channel so that carriers are transferred between the second and first organic layers in response to a voltage applied to the gate electrode. Nishizawa, however, does not suggest that first and second organic layers would work in a FET with a channel region of a layered structure of at least two films of different organic compounds,⁵ since Tsumura discloses an electrically insulating film 3 between the gate electrode 2 and the organic channel region 6.

Furthermore, it is not clear from the record how Nishizawa's first and second organic layers formed of polythiophene could be incorporated into Tsumura's layered organic channel region. In Nishizawa, the FET in Fig. 3 is formed by replacing the insulating layer 3 shown in Fig. 1 with a second organic layer 13, and the second organic layer 13 is not in contact with either the gate electrode 12, source electrode 14, drain electrode 15, and the first organic layer. Whereas, in Tsumura, the FET in Fig. 2 is formed by stacking an organic layer 7b on an organic layer 7a, namely, the organic layer 7b is not in contact with the gate electrode. Therefore, the organic layer 7b in Tsumura is different from the second organic layer 13 in Nishizawa. Such modification would require a substantial reconstruction or redesign of the elements of Tsumura, and/or would change the basic principle of operation of Tsumura. There is no evidence that a person of ordinary skill in the art would be motivated to perform such changes and redesign.⁶

Tsumura and Nishizawa, therefore, do not provide the motivation to perform the proposed modification of Tsumura. In other words, an attempt to bring in the isolated teaching of Nishizawa's second organic layer into Tsumura would amount to improperly

⁵ See Tsumura in the Abstract, for example.

⁶ See In re Ratti, 270 F.2d 810, 813, 123 USPQ 349, 352 (reversing an obviousness rejection where the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate.")

picking and choosing features from different references without regard to the teachings of the references as a whole.⁷ While the required evidence of motivation to combine need not come from the applied references themselves, the evidence must come from *somewhere* within the record.⁸ In this case, the record fails to support the proposed modification of Tsumura.

In rejecting a claim under 35 U.S.C. §103(a), the U.S.P.T.O. must support its rejection by "substantial evidence" within the record,⁹ and by "clear and particular" evidence¹⁰ of a suggestion, teaching, or motivation to combine the teachings of different references. As discussed above, there is no substantial evidence, nor clear and particular evidence, within the record of motivation for modifying Tsumura by incorporating Nishizawa's first and second organic layers formed of polythiophene. Without such motivation and absent improper hindsight reconstruction,¹¹ a person of ordinary skill in the art would not be motivated to perform the proposed modification, and amended Claim 1 is believed to be non-obvious and patentable over the applied references.

In response to the rejection of dependent Claim 5 under 35 U.S.C. §102(b) as anticipated by Tsumura, Applicant respectfully submits that Tsumura does not teach or suggest that the interface between one of the first electrode, the second electrode and the first

⁷ See In re Ehrreich 590 F2d 902, 200 USPQ 504 (CCPA, 1979) (stating that patentability must be addressed "in terms of what would have been obvious to one of ordinary skill in the art at the time the invention was made in view of the sum of all the relevant teachings in the art, not in view of first one and then another of the isolated teachings in the art," and that one "must consider the entirety of the disclosure made by the references, and avoid combining them indiscriminately.")

⁸ See In re Lee, 277 F.3d 1338, 1343-4, 61 USPQ2d 1430 (Fed. Cir. 2002) ("The factual inquiry whether to combine references ... must be based on objective evidence of record. ... [The] factual question of motivation ... cannot be resolved on subjective belief and unknown authority. ... Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion").

⁹ See In re Gartside, 203 F3d 1305, 53 USPQ2d 1769 (Fed. Cir. 2000) (holding that, consistent with the Administrative Procedure Act at 5 USC 706(e), the CAFC reviews the Board's decisions based on factfindings, such as 35 U.S.C. § 103(a) rejections, using the 'substantial evidence' standard because these decisions are confined to the factual record compiled by the Board.)

¹⁰ See In re Dembiczak, 175 F3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("We have noted that evidence of a suggestion, teaching, or motivation to combine may flow from the prior art references themselves, the knowledge of one of ordinary skill in the art, or, in some cases, from the nature of the problem to be solved, although 'the suggestion more often comes from the teachings of the pertinent references.' The range of sources available, however, does not diminish the requirement for actual evidence. That is, the showing must be clear and particular.") (emphasis added).

¹¹ See MPEP 2141, stating, as one of the tenets of patent law applying to 35 USC 103, that "[t]he references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention."

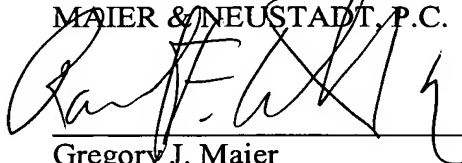
resistance layer rectifies an electrical current, as claimed in dependent Claim 5. Tsumura merely teaches that a thin film 7c allows the passing of carriers but almost no ions or dopants, and therefore the performance of the FET can be maintained at high level.¹² Accordingly, Tsumura does not teach or suggest the all the features of Applicant's dependent Claim 5. Therefore, Applicant respectfully requests reconsideration of the rejection of Claim 5 under 35 U.S.C. §102(b).

Consequently, in view of the present Amendment, no further issues are believed to be outstanding in the present application, and the present application is believed to be in condition for formal Allowance. A Notice of Allowance for Claims 1-18 and 20-45 is earnestly solicited.

Should the Examiner deem that any further action is necessary to place this application in even better form for allowance, the Examiner is encouraged to contact Applicant's undersigned representative at the below listed telephone number.

Respectfully submitted,

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¹² See Tsumura at column 7, lines 25-30.